

REMARKS

Claims 1-3 and 5-20 remain pending.

Applicants' Claimed Invention

Applicants' claimed invention is directed to an aqueous ink composition comprising water, a water-soluble solvent, a water-soluble resin, a dye, and a quick-drying property imparting agent, wherein the dye, if soluble in said water-soluble solvent, has a solubility in water lower than a solubility in the water-soluble solvent, said solubility of the dye in water being 10 wt% or lower, and the quick-drying property imparting agent has a solubility in water lower than a solubility in said water-soluble solvent.

It is applicants' intent to provide an aqueous ink composition which exhibits drying properties similar to those exhibited by ethanol-based ink compositions but which do not include water as a solvent. Further, the ink composition of the present invention exhibits highly desirable drying properties in comparison to prior art compositions. More specifically, after the ink composition is applied to a printing material, the water soluble solvent first evaporates while water remains. As a result, the quick drying property agent is caused to precipitate

due to its low solubility in water so that excellent fixability (ink dryability) is attained.

Applicants' invention is neither disclosed nor suggested by the prior art.

Rejection of Claims 1-16 and 19-20 under 35 USC 103(a)

Claims 1-16 and 19-20 stand rejected under 35 USC 103(a) as being unpatentable over JP 53-140105 in view of Kitamura et al U.S. Patent No. 6,498,222 or Ohta U.S. Patent No. 6,211,265. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

JP '105 discloses an aqueous ink composition comprising water, a hydrophilic solvent, a water-insoluble binder, and europium-thenoyltrifluoroacetone chelate as a fluorescent substance. In both the JP '105 reference and the claimed invention, the europium complex is used together with a colorant, solvent and water. However, the JP reference is silent with respect to quick-drying properties, and in particular, neither discloses nor suggests that a quick-drying property imparting agent such as benzotriazole could or should be added to shorten the fixing time.

Moreover, the JP reference uses a high-boiling point hydrophilic organic solvent such as ethylene glycol monoethyl ether. This is in contrast to the present invention which requires the use of a water-soluble solvent having either a boiling point lower than that of water, or a vapor pressure higher than that of water in order to enhance drying properties of the ink composition.

Kitamura does not cure the deficiencies of JP '105.

The reference teaches that a cationic polymer having an affinity to a colorant is used to improve waterfastness. The patent only contemplates good drying properties with respect to papers by use of a penetration accelerator as specified in claim 22.

As described above, the claimed invention utilizes the difference in the solubility of the quick-drying property imparting agent in water and the water-soluble solvent to attain quick-drying properties not only for paper but for impermeable printing materials such as plastic films. Such a concept is neither disclosed nor suggested by the reference.

It is noted that benzotriazole (one of applicants' quick-drying property imparting agents) is mentioned in the Kitamura reference. However, the reference uses benzotriazole as a

clogging presenter, which prevents ink from drying on the front end of a nozzle (see column 10, lines 11-25). Thus, the claimed invention is clearly distinct from that of Kitamura.

Kitamura further teaches at claim 22 that a solvent having a lower vapor pressure than water is preferably used. This is also in direct contrast to applicants' invention, which instead requires the use of a water-soluble solvent having either a boiling point lower than that of water, or a vapor pressure higher than that of water in order to enhance drying properties of the ink composition.

Ohta discloses a water-soluble cationic polymer having an affinity to colorants may be used to improve waterfastness. The patent studies quick drying properties concerning papers by use of penetration accelerators (column 8, lines 58-61).

The present invention, by contrast, utilizes the difference in solubility of the quick-drying property imparting agent in water and the water-soluble solvent to attain quick drying properties not only for paper but also for impermeable printing materials such as plastic films. Such a concept is neither disclosed nor taught by the reference.

The present invention admittedly exemplifies as the quick-drying property imparting agent - i.e., benzotriazole (see

column 7, line 45) - which is also mentioned in the reference. However, the reference uses benzotriazole as a dissolution accelerator which easily dissolves inks even after being dried so as to prevent the inks from being dried at the tip of nozzles. Thus, the present invention is clearly different from that of the reference with respect to the purpose of use of benzotriazole. Further, the reference teaches at column 5, lines 55-58 that a solvent having a lower vapor pressure than water is preferred for use. This teaching is in direct contradiction to the claimed invention.

Accordingly, taken as a whole, the reference fails to teach or suggest applicants' claimed invention.

Further, the recited combination of references fails to result in the claimed invention. The Examiner fails to provide basis or motivation in the cited references for the modification of the JP reference in view of the teachings of the secondary references that would result in the claimed invention.

In view of the above, the rejection is without basis and should be withdrawn.

Rejection of Claims 17-18 under 35 USC 103(a)

Claims 17-18 stand rejected under 35 USC 103(a) as being unpatentable over JP '105 in view of Ohta, Doi U.S. Patent No. 6,378,999 or Yatake et al U.S. Patent No. 6,051,057. This rejection respectfully is traversed to the extent deemed to apply to the claims as amended.

The deficiencies of JP '105 are discussed above. The additionally-cited Ohta, Doi and Yatake references do not cure the deficiencies of JP '105.

As noted previously, Ohta discloses at column 2, lines 16-34 that a colorant having a specific structure is used in combination with a highly reactive water-soluble cationic polymer having a primary amino group to attain good lightfastness and waterfastness. However, as discussed above, the reference does not disclose or suggest that water, a water-soluble solvent as defined by claim 1, a water-soluble resin, a dye having low solubility in water (10 wt.% or lower), and a quick drying-property imparting agent having solubility in water lower than a solubility in the water-soluble solvent are used to attain an excellent drying property as claimed. Further, the reference neither discloses nor suggests the use of a fluorescent dye.

Doi teaches at column 4, lines 22-23 that the coloring material is not particularly restricted. However, Examples 1-17 employ pigments such as carbon black as the coloring material. Thus, the reference is substantially directed to a pigment ink. The reference merely mentions dyes as the coloring material but does not teach that the dye has a solubility in water lower than a solubility in a water-soluble solvent to attain good drying properties as in applicants' invention. As described at column 2, lines 3-38, the object of the reference is to attain good dispersion stability and printing quality. Thus, the advantage of the present invention - good drying property - is not obvious from the teachings of the reference.

Yatake teaches at column 2, lines 20-25 an ink composition which includes a water-soluble colorant, a water-soluble organic solvent, and water. As the water-soluble solvent, alcohols are mentioned at column 6, lines 18-21. However, the reference does not teach that the dye has solubility in water lower than a solubility in the water-soluble solvent to attain good drying properties as in the claimed invention.

Given the noted deficiencies of the cited references, the combined teachings of the references do not result in the claimed invention. The Examiner fails to provide basis for the

modification of the JP reference in view of the teachings of the secondary references that would result in the claimed invention.

The rejection is thus improper and should be withdrawn.

Conclusion

The cited prior art neither discloses nor suggests the use of a benzotriazole compound for use as a drying agent, especially for use on an impermeable sheet. The teaching by the references of the use of benzotriazole as an anticlogging agent is contradictory to the claimed invention. The cited references fail to disclose or suggest the attainment of excellent fixability (ink dryability) utilizing specific solubility and boiling point (vapor pressure) of components in an ink composition as defined in applicants' claimed invention. Applicants' claimed invention is accordingly patentably distinct from the cited prior art.

The application is now believed to be in condition for allowance and an early indication of same is earnestly solicited.

In the event that any outstanding matters remain in this application, Applicants request that the Examiner contact James


W. Hellwege (Reg. No. 28,808) at (703) 205-8000 to discuss such matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Very truly yours,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

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